

Mobile Assistance for Blind People

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Abstract—In the competitive world mobile plays an important role in communication. Calling, Messaging are basic needs for communication, but the visually impaired people are not able to interact like normal people. There are many different applications to provide the interaction between android and visually impaired people. But all the basic functionalities are not available in single application. This paper is based on providing some basic functionality like Messaging, Calling, Alert for battery status and current time in single application. This application is mainly implemented through gestures and voice interaction.

I. INTRODUCTION

The sighted people can use smart phones easily but due to the inability to read information on the screens, the blind and visually impaired encounter serious problems in leading an independent life. The System which we are developing, is in need for blind people to use the touch screen Android based mobile phones. This system is very helpful for blind people. Using this system they can communicate like a sighted person. Empowering the disabled is the current need. There are many applications built in android for the visually challenged, but maximum do not focused on the basic problems faced by them. The applications are good but they do not address the basic needs of a blind person. The visually impaired people are able to know the current time, read and write the SMS, alert for battery level and make call using the proposed android application interface for communication system. There is need to implement an application to provide ease of accessibility to the basic functionalities. The basic objective of this project is to overcome the limitations of the applications stated above and provide a single application to help the visually challenged user. The process used to solve the problem is by using the voice i.e. text-to-speech and vice versa and by gestures. The user can give the input through voice and gesture. To achieve this objective the following features have been implemented Messaging, Calling Alert for Battery, Current Time using launcher. Incase if the application is closed by the user the launcher is automatically waked up after 3 seconds by wakeup function.

II. PROPOSED ARCHITECTURE

The proposed system architecture is divided into four major modules: Help Menu module, Call module, Message module, Battery status and Current time module. Each module plays a distinct and fundamental function.

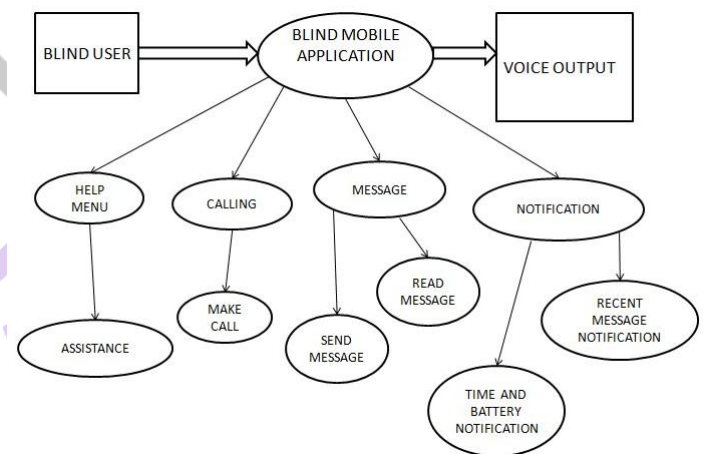


Fig. 1. Proposed Architecture

The figure 1. illustrates the architecture of the proposed system. The Inputs are Voice and Gesture. In Help Menu module is to assist the user how to use the application. In Call module the application allows user can make call. In Message module the application sends and reads recent received message. In Notification module such as battery status and current time are notified through voice.

III. SYSTEM DESIGN

A. TTS

Text-to-Speech (TTS) system converts normal language text into speech. Android provides TextToSpeech class for this purpose. In order to use this class, you need to instantiate an object of this class and also specify the `initListner`.

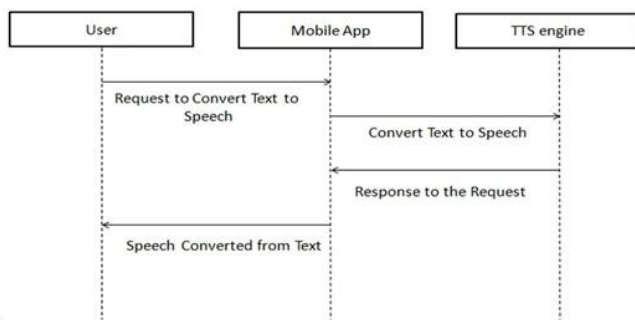


Fig. 2. Text-to-Speech



Fig. 4. Gesture

Parameters: Text characters.

Purpose: This function will convert the text characters into audio which the user can listen.

B. STT

Speech-To-Text allow you convert your speech into text. STT technology that enables the recognition and translation of spoken language into text by computers and computerized devices such as those categorized as smart technologies and robotics. It is also known as *automatic speech recognition* (ASR), *computer speech recognition*, or just *speech to text* (STT). Some SR systems use training where an individual speaker reads text or isolated vocabulary into the system. The system analyses the persons specific voice and uses it to ne tune the recognition of that persons speech, resulting in increased accuracy. Systems that do not use training are called speaker independent systems. Systems that use training are called speaker dependent.

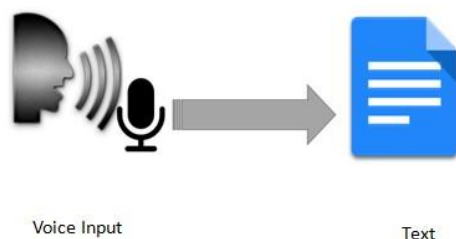


Fig. 3. Speech-to-Text

D. GestureDetector

Android provides GestureDetector class to receive motion events and tell us that these events correspond to gesture or not. To use it, we need to create an object of GestureDe- tector and then extend another class with GestureDetector. SimpleOnGestureListener to act as a listener and override some methods.

IV. IMPLEMENTATION

Modules used in this application are as follows:

- 1) Help Menu.
- 2) Message and Alert.
- 3) Call.

A. Help Menu

The figure 5, depicts Help Menu. On double tap on the mobile screen, this application provides operational guidelines to use the application.

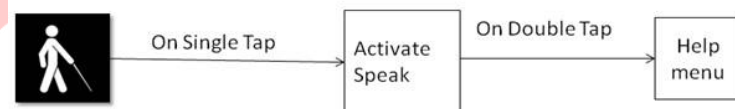


Fig. 5. Help Menu

B. Message

Read message or alert: To listen recent message content or know battery level and current Time.

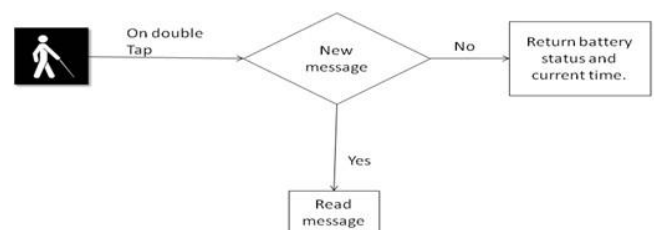


Fig. 6. Read Message or Alert

Parameters: audio.

Purpose: This function will convert the audio received from microphone to text characters.

C. Gesture

Android provides special types of touch screen which are shown in figure 4, such as single tap, double tap, long presses, and flinch . These are all known as gestures.

The above figure 6, depicts read message or alert. When the user double taps on screen the recent received message is read via speech else the current battery status and time is notified via speech.

Reply message: To send reply message to recently received message. The below figure 7, depicts to send reply message

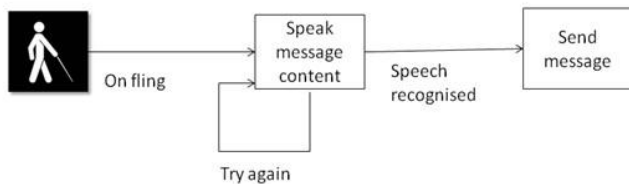


Fig. 7. Reply Message

to recently received message the user needs to provide fling gesture(swipe).

C. Calling

To make call through voice.

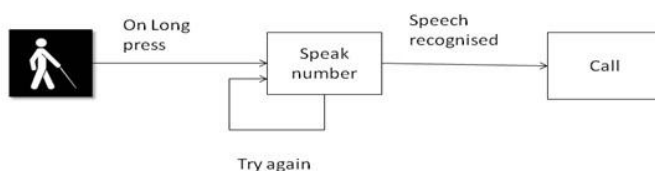


Fig. 8. Call

The below figure 8, depicts calling. To call the user needs to long press on the mobile screen and mobile number is given as input via speech.

V. CONCLUSION & FUTURE SCOPE

Using this application, blind can read/write a message and also able to call to any person. This application will help him to know the battery status and time. This application can also improve by giving varies facilities which can help the blind users.

In a future version of the proposed system it may be interesting to allow the introduction of marketing information in the users application, allowing blind users to easily be aware of recent promotions and products and also recent news updates. This additional feature may bring commercial relevance to brands and store owners since it enables publicity of services and products to a wider audience.

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